

# At Naval Station Newport, Aerogel Insulation Upgrades Energy Efficiency of Steam Lines, ROI in Less Than Two Years

Thin, flexible, waterproof aerogel insulation a perfect fit for confined-space steam pipes

## CASE STUDY

### DETAILS

Location: Naval Station Newport  
Insulation Contractor: Anchor Insulation

### CHALLENGES

- Insulation of a 10" underground steam distribution line located in concrete trenches with difficult access and included a road crossing.
- Trench was confined space with debris build up and other interfering piping.
- Existing fiberglass insulation on line was 20-30 yrs. old and had water and mechanical damage.
- New insulation was to provide energy savings and demonstrate ROI.

### SOLUTIONS

- Trenches were opened, and existing insulation and jacketing were removed.
- Two layers of **Pyrogel® XT** (20 mm, 0.8") were installed with new aluminum jacketing.
- Installing at a rate of 18 linear feet of pipe per hour, 220 linear feet of piping was insulated by a three-person crew in 1.5 working days.
- Pyrogel XT fit in the tight clearance areas without difficulty. Thicker insulation would have required "thinning" in these areas.
- Pipe section was instrumented and monitored for temperatures and mass flow to validate predicted energy savings. Measured temperatures and mass flow correlated well with predicted model.

### BENEFITS

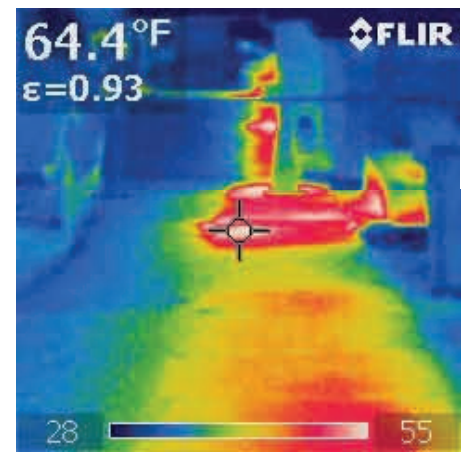
- Installation was faster than cellular glass.
- Superior water management provides long-term protection against performance degradation and corrosion due to repeated flooding.
- Energy savings based on six months of service per year = 745 MBTU/yr. (6,269 gal. heating oil/yr.).
- Cost savings based on six months of service per year = \$24,575.
- ROI – 0.85 year simple payback.



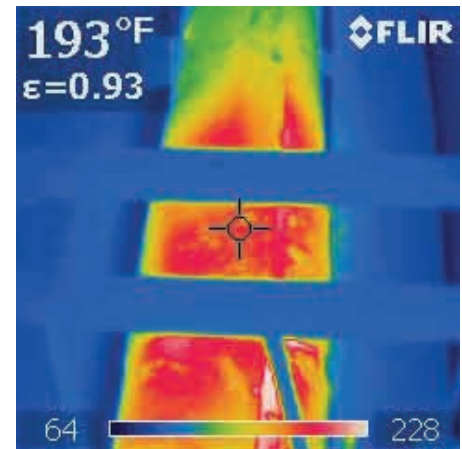
### Thermal Performance Results of Aerogel Installation

Property	Fiberglass, In-Service	Aerogel (Pyrogel XT - 20 mm)
Surface Temp (°F)	149 - 217	97
Heat Loss (million BTU/yr.)	614 - 1,209	166
Energy savings (million BTU/yr.)	N/A	448 - 1,043
Fuel Savings per year (gal)	N/A	3,767 - 8,771
Cost Savings per Year (\$)	N/A	\$14,768 - \$34,382
Estimated Payback (years)	N/A	0.51 - 1.18

Heat from steam line warms trench covers to 64°F; ambient temperature 34°F



Insulation under cladding severely degraded over time; degradation exacerbated by trench flooding events



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